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nected with the Indian railway system by a line *via* Mandalay, the Chinwin valley, and a somewhat difficult mountain-pass. Then, again, the proposed route lies almost wholly within Siamese territory. But the government of Siam lives in great dread of French encroachments, and would probably welcome the English. At any rate, the Shans everywhere assisted Mr. Hallett, and expressed the greatest anxiety for better communications. Finally, it would tap only a portion of Yunnan, and would depend to a great extent for success on the building of railroads by Chinese themselves.

It must not be supposed that Mr. Hallett spent all his time in taking altitudes and other surveying work. He kept his eyes wide open, and has added vastly to our knowledge of the resources of Siam and of Siamese ethnology. In short, to use the words of Mr. Colquhoun, his work "has shed a bright ray of light upon a hitherto dark blot in our geographical knowledge, central Indo-China."

EDWARD CHANNING.

#### LONDON LETTER.

THE British association for the advancement of science will meet in Birmingham on Wednesday, Sept. 1, under the presidency of Sir William Dawson, LL.D., F.R.S., of the McGill university, Montreal. It will derive more than usual interest and importance from the exhibition of local manufactures within a radius of fifteen miles of the city, which is to be held in connection with it. The association has met thrice previously in Birmingham, — in 1838, 1849, and 1865, — and on each occasion such an exhibition was held. To the example of the first of these are due all international and other exhibitions since conducted on so large a scale.

The names of the royal commissioners on the working of the elementary education act of 1869 have just been published. The list comprises twenty-two names, all of those interested from various points of view, in the working of the act. The present government deserves great credit for the constitution of the *personnel* of the commission, which is a very strong one, all the chief religious, social, and political interests being well represented thereon. Sir John Lubbock is perhaps the strongest and most influential advocate for a place for pure science as an instrument of education, that could be found. His utterances thereon always command the respect of the house of commons and of the country. Sir Bernard Samuelson represents technical education; Mr. Samuel Rathbone (chairman of Liverpool school board), the official school board; Mr. Thomas

Heller, the body of teachers; and so on. Until this commission has reported, no legislation on the subject is likely to take place, although for a long time a feeling has been growing in the public mind that changes are necessary.

One result of the present educational system is that young persons leave the elementary schools at the ages of twelve or thirteen, and in the majority of instances go to work during the whole or a portion of the day, and scarcely ever pursue their education further. Inquiries set on foot by Canon Percival in Bristol, for example, elicited the fact that not five per cent of the children who thus leave school continue their education, in the scholastic sense of the term. To meet this difficulty, a system of evening classes has been devised, differing from such ordinary classes, inasmuch as the instruction is recreative, scientific, and practical. Attractive methods of teaching and demonstration are employed, in which the optical lantern has a large share. To Dr. Paton of Nottingham is mainly due the initiative of this movement, which was inaugurated for London at a crowded meeting held at the Mansion House on Jan. 16, presided over by the lord mayor, attended by the Princess Louise, and addressed by representatives of all shades of theological, political, and social position, from the Bishop of London and Mr. Mundella (who gave some startling figures as to the compulsory attendance on evening-schools in Germany) to representative workingmen. It was stated that in London alone there were nearly half a million (420,000) young persons to whom the scheme would apply.

An important change in the matriculation examination of the University of London was, on Tuesday, Jan. 19, recommended to the senate by convocation, which, on the motion of Mr. W. L. Carpenter, B.A., B.Sc., adopted the report of a committee upon the subject. Hitherto three scientific subjects have been compulsory, — mathematics, natural philosophy (so called), and chemistry, and no alternatives were allowed. Under the proposed scheme, the 'natural philosophy' is subdivided, and a portion only is made compulsory. It is headed 'mechanics,' and the syllabus comprises those elementary but fundamental notions of statics, dynamics, etc., which are at the basis of all science. A candidate is then allowed an option between three branches of experimental science; viz., chemistry, heat and light, magnetism and electricity. Chemistry, therefore, ceases to be a compulsory subject (a change which may meet with the outcry directed some years ago against the abolition of Greek as a compulsory subject), while encouragement is given to the study of other branches of physics.

Two very wonderful engineering works have just been brought to a conclusion, both of the same character, — tunnels under rivers. The smaller, but the one of more interest to Americans probably, is that under the Mersey, between Liverpool and Birkenhead, which was opened a few days ago by the Prince of Wales. On the morning preceding the opening, trains passed from James Street station on the Liverpool side, to Hamilton Square station on the Birkenhead side, in three minutes and a half. From the spot in the centre, where the mayors of Liverpool and Birkenhead many months ago shook hands over a piece of red tape, the tunnel extends two hundred and fifty yards in each direction in a perfectly straight line. The Severn tunnel is a much more gigantic work. As the river estuary is more than two miles wide, and from seventy to eighty feet deep, the subaqueous tunnel itself, and its approaches, extend to four miles in length. It has been constructed solely by the Great western railway company, at a total cost of nearly nine million dollars (£1,750,000), and its purpose is to facilitate the transfer of coal from the South Wales coal-field to Southampton, and other places in the south and west of England. Recently coal raised at Aberdare in the morning, was shipped at Southampton (on mail steamers, etc.) in the evening. The tunnel is not yet opened for passenger traffic. The greatest difficulty in its construction; arose from the intrusion of water, not from the Severn alone, but from springs in the Pennant grit and other geological strata, two or three miles away. The source of this water, in the early days of the tunnel construction (1877-78) was first shown by the present writer.

The scientific relief fund, which is held in trust by the president and council of the Royal society, is likely to receive a very welcome addition to its resources from Sir William Armstrong. The existence of the fund dates from 1859, and is in great measure due to the exertions of the late Mr. Gasiot. The interest is applied to the relief, under certain conditions, of such scientific men or their families as may from time to time require assistance. Since January, 1861, when the first grant was made, about £4,600 have been distributed in nearly one hundred grants. The present amount of the trust is £7,000, and Sir William Armstrong is very anxious to see it raised to £20,000. He therefore proposes himself to give half the sum required, provided that the fellows, with the assistants, if necessary, of other friends of science outside of the society, will raise the remaining £6,500. Several contributions towards this end have already been promised, and it is hoped that there will be no difficulty in making up the sum

required, as the present income of the fund is by no means equal to the demands upon it. W.

London, Jan. 24.

#### NOTES AND NEWS.

THE recent unusual cold weather in Florida, which caused so much injury to fruit-trees, is said to have destroyed in some places large numbers of fish in the shallow waters, benumbing them, and permitting them to be cast on the beaches in windrows.

— Dr. J. W. McLaughlin, president of the Texas state microscopical society, claims to have discovered sphero-bacteria in that peculiar southern disease known as dengue, or 'break-bone' fever, and further to have isolated and cultivated them.

— It is interesting to note, that, at a recent meeting of the Royal geographical society, Admiral Sir Leopold McClintock said that "it was a companion of Major Greeley, the late lamented Lieut. Lockwood, who had made the nearest approach to the north pole yet accomplished."

— We call attention to a new map of the Congo, corrected up to October, 1885, that has just been issued by Letts, Son, & Co., of London. The topography is laid down in great detail, the scale being 45 miles to the inch.

— The German parliament has again appropriated 30,000 marks, or about \$7,500, to assist Dr. Dohrn's zoölogical institution at Naples.

— The New York *Herald* of Feb. 5 states that M. de Jousselin, commander of the steamship St. Laurent, reports observing on his last easterly voyage a magnificent aurora borealis far out on the ocean. The St. Laurent was at the time in latitude 44° 20' north, longitude 57° 3' west. The brilliant phenomenon extended from west-north-west almost to north-east, the luminous rays, white and red, mounting up to about seventy degrees above the horizon, and stars of the first magnitude were visible through the blue rays. The observations show that the aurora occurred in connection with a cloud-covered sky and in the rear of a storm which had a short time previously passed the steamer.

— The progress of psychical research has been most marked in England, but has not failed to attract attention in Germany, France, and the United States. A journal especially devoted to the historical and experimental "begründung der übersinnlichen weltanschauung auf monistischer grundlage," has been established in Germany. The journal is called *Sphinx*, and will be issued monthly by L. Fernau of Leipzig. Dr. T. U.